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energy source <

# IntelliTEMP™ 900

INSTALLATION INSTRUCTIONS

(Operator: Save these instructions for future use!)

FAILURE TO READ AND FOLLOW ALL INSTRUCTIONS CAREFULLY BEFORE INSTALLING OR OPERATING THIS CONTROL COULD CAUSE PERSONAL INJURY AND/OR PROPERTY DAMAGE.

DESCRIPTION

This IntelliTEMP™ thermostat replaces the following thermostats:

• Heat Pump (No Aux. or Emergency Heat)
• Heat Pump (up to 4H/2C)
• Single Stage Heat & Cooling Systems
• Up to Two Stage Heat or Two Stage Cool
• Heat Only Systems
• Standard Central Air Conditioning
• Hydronic (Hot Water) Zone Heat – 2 Wires
  (But not Hydronic zone heat with 3 wires)
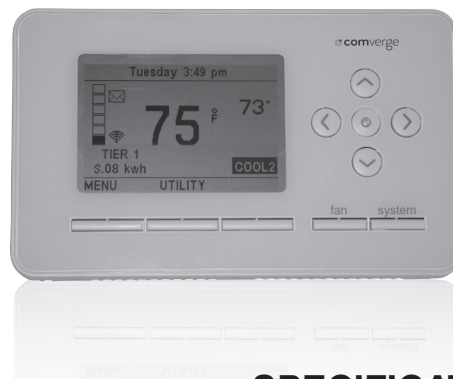
SPECIFICATIONS

Electrical Rating:
    Input-Hardwire .... 20 to 30 VAC
Terminal Load .... 1.5A per terminal, 2.0A maximum all terminals combined
Setpoint Range .... 45 to 99°F (7 to 37°C)
Operating Ambient .... 32°F to +105°F (0 to +41°C)
Operating Humidity .... 90% non-condensing max.
Shipping Temperature Range .... -40 to +150°F (-40 to +65°C)

⚠ CAUTION

To prevent electrical shock and/or equipment damage, disconnect electric power to system at main fuse or circuit breaker box until installation is complete.

ATTENTION: MERCURY NOTICE
This product does not contain mercury. However, this product may replace a product that contains mercury.

Mercury and products containing mercury must not be discarded in household trash. Do not touch any spilled mercury. Wearing non-absorbent gloves, clean up any spilled mercury and place in a sealed container. For proper disposal of a product containing mercury or a sealed container of spilled mercury, place it in a suitable shipping container. Refer to **www.thermostat-recycle.org** for location to send product containing mercury.

CONTENTS

⚠ WARNING

Do not use on circuits exceeding specified voltage. Higher voltage will damage control and could cause shock or fire hazard.

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INSTALLATION

Pre-Installation Checklist

Before you begin to install your IntelliTEMP™ thermostat:

- Read these instructions thoroughly.
- Check the package from your thermostat to make sure you have all of the required parts (see below).
- Assemble the required tools (see below).

Required Parts

- Thermostat (1)
- Wall anchors (2)
- Mounting screws (2)

Required Tools

- Flat blade screwdrivers – 1 large and 1 small
- Hand or power drill with 3/16 inch drill bit
- Wire strippers
- Level (optional)

QUICK GUIDE

1) **Remove the old thermostat**
   - Turn off power at the breaker.

⚠ CAUTION

To prevent electrical shock and/or equipment damage, disconnect electric power to system at main fuse or circuit breaker box until installation is complete.

- Remove cover from old thermostat to expose wires.
- Identify each wire to corresponding terminal and disconnect.
- Remove old thermostat from wall, making sure that thermostat wires do not fall back into wall opening.

2) **Mount the new thermostat**
   - Feed thermostat wires through thermostat hole.
   - Feed antenna wire through wall opening.
   - Wire new thermostat.
   - Turn on power at breaker.
3) **Configure the thermostat**
4) **Check thermostat operation**
5) **Verify Communications**

The sections that follow provide detailed instructions for completing these steps.

STEP 1: REMOVE THE OLD THERMOSTAT

Thermostat Components

The standard heat/cool thermostat normally consists of three basic parts:

1. Cover.
2. Base, which you can remove by loosening all screws.
3. Switching sub-base or Mounting base, which you can remove by unscrewing the mounting screws that hold it on the wall or adaptor plate.

Remove the old thermostat:

1. Remove the front cover of the old thermostat.
2. With wires still attached, remove wall plate from the wall by unscrewing it. If the old thermostat has a wall mounting plate, remove the thermostat and the wall mounting plate as an assembly.
3. Identify each wire attached to the old thermostat as shown in the diagram below. Before removing wires from old thermostat's switching sub-base, label each wire with the letter on the old thermostat. Ignore wire colors and use the letter designation only.
4. Disconnect the wires from the old thermostat one at a time.

Important: Do not let wires fall back into the wall.

NOTE

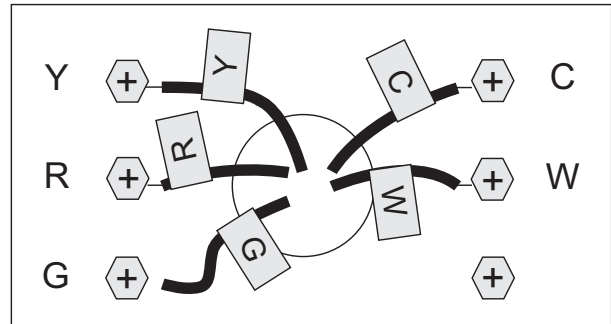**You may want to wrap the wires around a pencil to keep them from falling back into the wall.**

Figure 1. Thermostat wires with labels

STEP 2: MOUNT THE NEW THERMOSTAT

⚠ CAUTION

Take care when securing and routing wires so they do not short to adjacent terminals or rear of thermostat. Personal injury and/or property damage may occur.
To prevent personal injury and/or property damage, contact Customer Service at your utility company before attempting any step in the installation process that you are unsure about how to perform.

Mount the new thermostat:

1) **Unpack the thermostat and separate the mounting plate from the thermostat.**

   Remove the packing material from the thermostat. Gently pull the thermostat straight off of the base: hold the thermostat from the back by the lower corners with one hand, and pull the mounting plate off with the other hand.

NOTE

**Forcing or prying on the thermostat will cause damage to the unit.**

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2) **Feed thermostat wires through rectangular hole between the terminal blocks in the thermostat mounting plate.**

3) **Connect wires to the thermostat mounting plate.**
   Connect wires beneath terminal screws on base. The photo on next page shows the location of the wire terminals in the IntelliTEMP™ 900. There are two sets of terminals on either side of the hole the wires are fed through. Each terminal is labeled with a letter or a letter with a number (O, B, R, etc.).

Connect wires as follows:

- Strip insulation about 3/8 inch from end of wire.
- Feed thermostat wires through rectangular hole in the thermostat mounting plate.
- Locate the terminal that the wire needs to connect to. Use the Wiring Chart on page 6.
- Bend the wire slightly, insert the wire between contact plates, and tighten the screw down onto the wire.

For full details on where to connect each wire, see "Wiring Chart" on page 6.

Wire terminals. Insert wires here

Feed wires through this hole
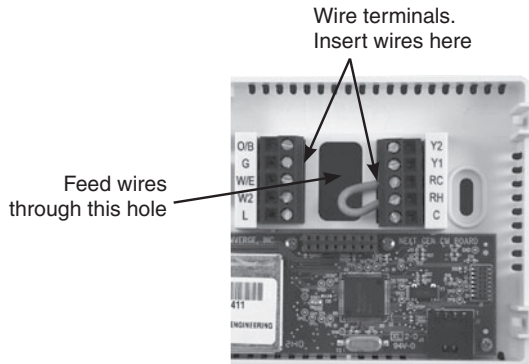
4) Mark mounting hole locations.

Place thermostat mounting plate over hole in the wall and mark mounting hole locations (see below) using the mounting plate as a template.
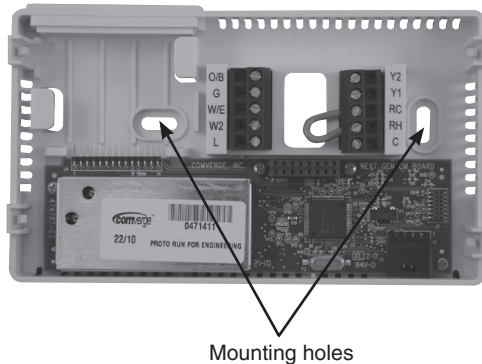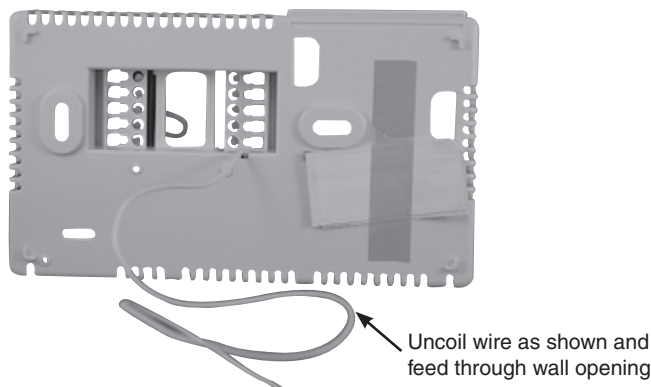

Mounting holes

5) Drill holes.

Move mounting plate out of the way. Drill mounting holes using a 3/16 inch drill bit.

6) If device has wire, uncoil antenna wire and feed through wall opening.

The white antenna wire will be coiled up on the back of the thermostat. Uncoil the wire (as shown below) and feed it through the wall opening. This antenna wire is used to communicate with the thermostat.

Uncoil wire as shown and feed through wall opening

7) Mount thermostat mounting plate.

Fasten mounting plate loosely to wall using two mounting screws in mounting holes.
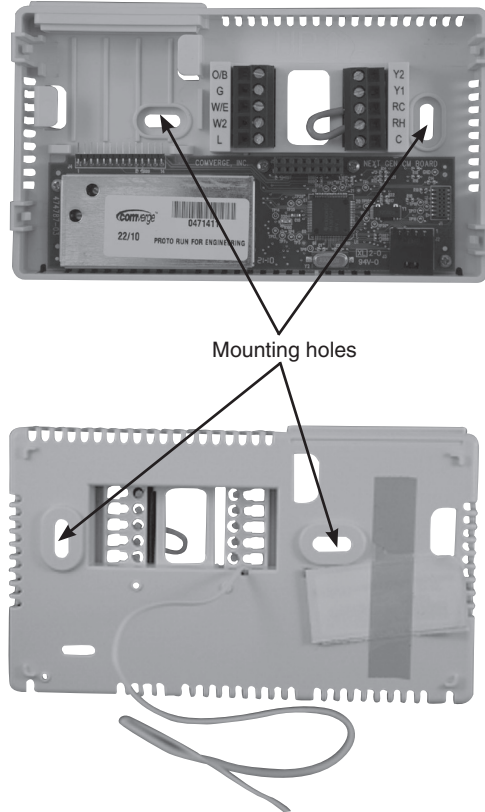

Mounting holes

If desired, place a level against bottom of the mounting plate and adjust until level before tightening screws. (Leveling is for appearance only and will not affect thermostat operation.)

If you are using existing mounting holes, or if the holes drilled are too large and do not allow you to tighten base snugly, use plastic wall anchors to secure sub-base.

Push excess wire into the wall and plug the hole with a fire resistant material (such as fiberglass insulation) to prevent drafts from affecting thermostat operation.

8) Fasten Thermostat to Mounting plate

The IntelliTEMP™ is designed with a quick connect feature between the thermostat unit and mounting plate. When installing the thermostat onto the mounting plate, make sure the retention tabs on the mounting plate are in line with

Retention slots

Retention tabs

3
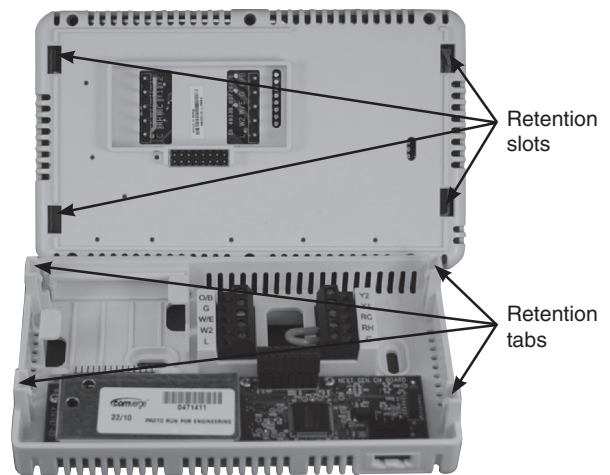
INSTALLATION

the retention slots in the thermostat (see previous page). Gently press the thermostat onto the mounting plate until you hear the retention tabs make a clicking sound and the thermostat is securely fastened to the mounting plate. If the thermostat does not easily click onto the mounting plate, be certain not to press with excessive force or else damage could occur to the thermostat and/or mounting plate.

9) **Turn power back On at breaker.**
   When power is applied, verify the IntelliTEMP™ 900 thermostat powers up and begins to display the room temperature.

STEP 3: CONFIGURE THE NEW THERMOSTAT

Configure the thermostat:

1. Press the **SYSTEM** button until the system mode displays OFF.
2. Simultaneously press and hold the ⟨ and ⟩ buttons to enter the Installation Menu. First screen asks for confirmation to enter the installation menu. Once confirmed, the display will show the first level of the Installation Menu.

3. While in the Installation Menu:
   - the ⌃ and ⌄ buttons scroll the cursor up and down respectively
   - The DONE softkey will confirm changes saved and go back one menu level.
   - The **HOME** softkey exits the installation menu back to the IDLE screen (NOTE: When the **HOME** softkey is pressed, any changes made on the current menu item are not saved).
   - The ⊙ button selects the highlighted menu item
   - The DONE softkey goes back one menu level if no changes were made.
4. To exit the menu and return to the program operation, press **HOME** (when available).
   If no keys are pressed within two minutes, the thermostat will revert to normal operation.

NOTE

It is important to select the proper setting for the first item on the configuration menu which specifies the type of HVAC system.

Installation Menu Options

The installation menu table summarizes the configuration options. For more details on each Installation Menu option, see "Description of Installation Menu Options" on page 7.

Menu Name	Submenu	Press ⌃ or ⌄ to Select Other Options (Defaults in BOLD)	Comments
HVAC Equipment Setup			
	Outdoor	Air Conditioner	1 Stage
		Air Conditioner	**2 Stage** (default)
		Heat Pump	Air - 1 Stage
		Heat Pump	Air - 2 Stage
		Heat Pump	Geo - 1 Stage
		Heat Pump	Geo - 2 Stage
		None	
	Indoor	Air Handler	No Heat
		Air Handler	Elec Heat - 1 Stage
		Air Handler	Elec Heat - 2 Stage
		Furnace	Gas / Oil - 1 Stage
		Furnace	**Gas / Oil - 2 Stage** (default)
		Boiler	1 Stage
		Boiler	1 Stage
Thermostat Setup			
Compressor Lockout		On	
		Off	
O/B Configuration		**O: Cool**	
		B: Heat	
Thermostat Data			
Firmware:			
Hardware Model:			
S/N:			
Communications Setup			
Device Information			
WAN Interface			

STEP 4: CHECK THERMOSTAT OPERATION

> ### ⚠ CAUTION
>
> **To prevent possible compressor and/or property damage, if the outdoor temperature is below 55ºF, DO NOT operate the cooling system.**

Once you have installed your new IntelliTEMP™ thermostat, you need to check that the fan, cooling system, and heating system are all operating properly.

Check Fan Operation

1. Press the SYSTEM button one or more times to select OFF.
2. Press the FAN button. Ensure the message **FAN ON** is displayed on the thermostat display. The blower should begin to operate. Place your hand by a vent to confirm blower is running.
2. Press the **FAN** button again. Ensure the **FAN ON** message is no longer displayed. The blower should stop immediately.

Check the Cooling System

Note: If system has 2 or more stages of heating and cooling, confirm thermostat settings menu item #7 is set to "Comfort".

1. Press the SYSTEM button one or more times to select **COOL**.
2. Press the ⌄ button to adjust thermostat setting 1° below room temperature. The outdoor unit should energize almost immediately in cooling mode and the indoor blower fan should energize within a minute of the start of the call for cool (depends on system configuration). The display should show "**COOL1**". NOTE: If compressor lockout is set to **ON**, the thermostat will not call for cool until after the 5 minute safety time period and will display the message **A/C return <5 min**. After the 5 minutes expire the thermostat will call for cool.
3. If the system is a multi-stage cooling system, adjust the temperature setting to at least 3° below room temperature. The second stage cooling should begin to operate and the display should show "**COOL2**".
4. Press the ⌃ button to adjust the temperature setting above room temperature. The cooling system should stop operating within a minute (depends on system configuration).

Check the Heating System

1. Press SYSTEM button one or more times to select **HEAT** mode.
2. Press the ⌃ button to adjust thermostat setting to 1° above room temperature. The heating system should begin to operate. "**HEAT1**" should display. NOTE: If the system is configured as a heat pump and compressor lockout is set to **ON**, the thermostat will not call for heat until after the 5 minute safety time period and will display the message **A/C return <5 min**. After the 5 minutes expire the thermostat will call for heat.
3. If the system is a multi-stage heating system, adjust the temperature setting to at least 3° above room temperature. The second stage of the heating should begin to operate and "**HEAT2**" should display. For Heat Pump systems with **AUX** heat configured, within a very short time the **AUX** heat should begin to operate and "**HEAT3**" then "**HEAT4**" (for multi-stage **AUX** system only) will be displayed.
4. Press the ⌄ button to adjust the thermostat below room temperature. The heating system should stop operating.

Check the AUX heating system (Heat Pump systems only):

The Auxiliary Heat bypasses the Heat Pump to use the heat source wired to E & W2 terminals of the thermostat. **AUX** is typically used when compressor operation is not desired, the user prefers to utilize the back-up heat only or the compressor is not able to satisfy the demand for heat to the user's desire.

1. Press SYSTEM button one or more times to select **AUX** mode.
2. Press the ⌃ button to adjust thermostat setting to 1° above room temperature. The **AUX** heating system should begin to operate. "**AUX1**" should display.
3. If the system is a multi-stage **AUX** heating system, adjust the temperature setting to at least 3° above room temperature. The second stage **AUX** heat should energize and "**AUX2**" should be displayed.
4. Press the ⌄ button to adjust the thermostat below room temperature. The heating system should stop operating within 1 minute (depends on system configuration).

   Return thermostat settings to "Economy mode" if changed to "Comfort mode" to check system.

STEP 5: VERIFY PAGING COMMUNICATIONS

Note: Only for paging systems

From the installer's menu, select the Diagnostics Display. If the IntelliTEMP™ 900 is able to correctly receive pages from the utility Head-End, the TC (Test Count) value should increment by one count at the rate at which the local utility sends out the test light off command (typically every 3 minutes).

WIRING CHART

For all systems, the following terminals are wired according to whether you have a single or dual transformer system as shown:

	RH	RC	C	L	G
Single Transformer System	24 VAC Hot Jumper should remain installed		24 VAC Common	Malfunction Light	Blower/Fan
Dual Transformer System	24 VAC – Heat *REMOVE PROVIDED JUMPER	24 VAC – Cool *REMOVE PROVIDED JUMPER	24 VAC Common	Malfunction Light	Blower/Fan

*Failure to remove provided jumper on dual transformer installations could cause severe damage to HVAC systems.

The following terminals on the thermostat mounting plate are wired according to the type of HVAC system connected to and the thermostat is configured as.

	Y1	Y2	W/E	W2	O/B
Conventional HVAC	Cool Mode Stage 1	Cool Mode Stage 2	Heat Mode Stage 1	Heat Mode Stage 2	-
Heat Pump	Compressor Contactor	Compressor Stage 2	AUX Heat Stage 1	AUX Heat Stage 2	Reversing Valve

DESCRIPTION OF INSTALLATION MENU OPTIONS

Description of Installation Menu Options

Following are detailed descriptions of the configuration menu options.

1. HVAC Equipment Setup

This menu item specifies the system configuration. Outdoor and indoor systems can be configured up to two stages each.

Note: If Heat Pump is selected as the Outdoor system Indoor selections are limited to Air Handler. A selection other than Air Handler will revert Outdoor system to Air Conditioner.

NOTE

It is important to select the proper setting for the HVAC equipment setup, even if you skip the rest of the Configuration menu.

If the system is a single or multi-stage conventional system, your options are:

Outdoor Equipment
- Air Conditioner   1 Stage
- Air Conditioner   2 Stage
- Heat Pump   Air - 1 Stage
- Heat Pump   Air - 2 Stage
- Heat Pump   Geo - 1 Stage
- Heat Pump   Geo - 2 Stage

Indoor Equipment
- Air Handler   No Heat
- Air Handler Elec Heat   1 Stage
- Air Handler Elec Heat   2 Stage
- Furnace Gas/Oil   1 Stage
- Furnace Gas/Oil   2 Stage
- Boiler   1 Stage
- Boiler   2 Stage

2. Thermostat Setup – Compressor Lockout

This menu item controls the compressor lockout feature. This feature is intended to help protect the compressor from short cycling. Some newer compressors already have a time delay built in and do not require this feature. Your compressor manufacturer can tell you if the lockout feature is already present in their system. When the thermostat compressor time delay occurs, **A/C return < 5 min** will be displayed on the messaging area of the thermostat.

Options for this menu item include:

- **OFF** – (Default) No compressor wait time. Assumes lockout feature is already present.
- **ON** – Waits 5 minutes before turning on the compressor after a power loss or during cooling/heating cycles. Protects the compressor from short cycling.

3. Thermostat Setup – O/B Configuration

This configures whether the O/B terminal for the heat pump reversing valve will be energized during cool (O) or heat (B) mode.

4. Thermostat Data

This screen provides the software version of the thermostat chassis firmware as well as the Hardware Model number of the thermostat chassis.

```
<      Thermostat Data


 Firmware: 0160 0263   07
 Hardware Model: 1F98-0600
 S/N: XXXXXXXX


   HOME                  DONE
```

5. Communications Setup – Device Information

This menu shows the Comverge device information for the thermostat communications interface board. This screen displays the system serial number, system model number, the communications interface board firmware version, rate address information and manufacturing populated information.

```
   Device Information  ▼

 S/N:    123,454,321
 Model:  IT-900
 FW:     01-10_1224
 Rate:   0
 A1:     0
   HOME                  DONE
```

```
   Device Information  ▲▼

 FW      01-10_1224
 Rate    0
 A1      0
 A2      0
 A3      0
   HOME                  DONE
```

```
   Device Information  ▲

 A3      0
 A4      0
 A5      0
 HW      FFFF
 MFG     080917
   HOME                  DONE
```

6. Communications Setup – Communications Interface

There will be a menu item(s) between the Device Information and Diagnostics menu items, dependent upon the communication technology installed in the device. Please reference the appropriate installation addendum for each communication technology installed in the device for instructions on these menus.

7. Communications Setup – Diagnostics

This menu show diagnostic information relevant to this device, such as the number of test count pages received, the number of sheds the device has performed, the number of cold starts (power loss), warm starts (microprocessor restarts), total resets and a communications loss count.

```
     Diagnostics      ▼

 Test Cnt   1,246
 Shed Cnt   0
 Cold Start 25
 Warm Start 72
 Resets     97
   HOME                  DONE
```

```
     Diagnostics      ▲

 Shed Cnt   0
 Cold Start 25
 Warm Start 72
 Resets     97
 Comm Loss  0
   HOME                  DONE
```

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